Adaptive parameterization for 3D shape optimization in aerodynamics

B. Abou El Majd[a], J-A. Désidéri[b], and A. Habbal[c]
[a]Université d'Avignon et des Pays de Vaucluse, 33 rue Louis Pasteur, 84000 Avignon
[b]INRIA, 2004 Route des Luciodes, BP 93, F-06902 Sophia Antipolis Cedex
[c]Université de Nice, 96 Avenue valrose, 06108 NICE Cedex 2

Abstract

We are interested to solve the problem of drag reduction in transonic regime. In Particular in this work, we optimize a geometrie of aircraft wing immersed in an inviscid flow. The shape is represented by using the so-called "Free-Form Deformation" approach based on 3D tensorial Bezier parameterization. In order to improve the convergence rate of the optimization algorithm and to reduce the critical dependency on the choice of the parameterization, an adaptive parameterization strategies by regularization is developed. Numerical experiment will be presented to demonstrate the efficiency of our approach by considering a geometric reconstruction problem and then a 3D shape optimization problem in aerodynamics.

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[0a] Corresponding author, E-mail: abouelmajd.b@gmail.com

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